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LUCAS & MERCANTI, LLP
475 PARK AVENUE SOUTH
15TH FLOOR
NEW YORK, NY 10016

EXAMINER
RILEY, MARCUS T

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/800,213	OKUYAMA, KENJI	
	Examiner	Art Unit	
	Marcus T. Riley	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *3/12/04* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *attached*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. **Claims 1, 3-7, 9-15 and 17-20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Shima et al. (US 6,104,498 hereinafter, Shima '498) in combination with Brown et al. (US 6,046,817 hereinafter, Brown '817).

Regarding claim 1; Shima '498 discloses a print data processing apparatus comprising: an auxiliary storage device which can store the print data (*"...in the image information print system in the first form, the storage means consists of a RAM and auxiliary storage means..."* column 3, lines 44-46); a write controller for starting write processing to write the print data stored in the receiving buffer into the auxiliary storage device when the free space in the receiving buffer has run out, and stopping the write processing when the free space in the receiving buffer is above a predetermined value before completion of writing (*"When data is transmitted from the host 1, first the reception task 71 starts processing upon reception of the data at step T1, performs data reception processing at step T2, and stores the received data in the reception buffer 83, then transmits data at step T3. Control is transferred to another task. The reception buffer 83 is formed in a RAM 44 and an auxiliary storage 45 such as a hard disk*

drive. A storage management task 81 determines which of the RAM 44 and the auxiliary storage 45 the data is to be stored in. It determines which of the RAM 44 and the auxiliary storage 45 the data is to be saved in so that the data can be saved and consumed most efficiently by considering the difference between the read time and the write time caused by the difference between the RAM 44 and the auxiliary storage 45, the print information transfer rate from the host, the print information processing (print information analysis to print execution) speed at the printer, and any other factors, as described above. For example, if print processing is delayed and data remains in the RAM 44 on a whole, some data is stored in the auxiliary storage 45 and then read into the RAM 44 as required, whereby both of the RAM 44 and the auxiliary storage 45 are used efficiently. Information concerning the storage locations of the data is written into a management table 82. The information in the management table 82 is transferred to the next task using the data. The storage management task 81 also manages the storage limit of the storage means as described above. If the storage means is about to reach the storage limit, the storage management task 81 informs, for example, the print management task 74 of the fact, as described above." column 12, lines 46-67 thru column 13, lines 1-8); and a developing unit for reading the print data from the receiving buffer or the auxiliary storage device to develop the print data into image data, wherein when the print data which has finished with the write processing is present in the auxiliary storage device, the developing unit reads the print data from the auxiliary storage device to develop the print data into image data ("*...and if conversion processing of intermediate print information into bit image data may be performed in a print information reception order in response to the paper discharge face information, converts the intermediate print information into bit image data in desired units without waiting for a cluster of intermediate print*

information to be stored in the storage means, or if the intermediate print information is converted into bit image data in an order reverse to the print information reception order, waits for a cluster of intermediate print information to be stored in the storage means before starting conversion of intermediate print information into bit image data." column 4, lines 38-49).

Shima '498 does not expressly disclose 1) a receiver for receiving print data 2) a receiving buffer for storing the received print data and 3) a receiving controller for stopping receiving processing of the print data performed by the receiver when a free space in the receiving buffer has run out, and resuming the receiving processing of the print data performed by the receiver when the free space in the receiving buffer is above the predetermined value.

Brown '817 discloses a receiver for receiving print data (*"...so the critical process in this situation with respect to the printer's overall throughput is the actual reception and initial buffering and processing of the incoming print data being received..."* column 19, lines 56-59); a receiving buffer for storing the received print data (*"Port B at 320 receives data and further communicates such data along a signal line 450 into "N2" receive buffers that are part of the input buffer 422. These receive buffers are designated by the reference numerals 451-455. Also residing in the input buffer 422 are "M2" transmit buffers 461-465, which temporarily store messages to be sent by the printer along a signal line 460 through Port B."* column 17, lines 1-7); a receiving controller for stopping receiving processing of the print data performed by the receiver when a free space in the receiving buffer has run out, and resuming the receiving processing of the print data performed by the receiver when the free space in the receiving buffer is above the predetermined value (*"The second communications buffer system is primarily designed to efficiently assign memory space for buffers used by the several communications*

ports from a predetermined amount of memory space (as a "pool" of memory) that has been allocated for external communications functions by the printer 10. It is preferred that the input buffer 22 be allocated a certain percentage of the printer's overall RAM, and then the control system described herein below will determine how much of that allocated RAM shall be provided for the buffers used by each of the individual ports. Upon initialization of the printer, the pool of RAM that is allocated for the communications ports will be a relatively large quantity, however, each individual port will only be allocated a fairly small portion of that pool area of RAM. Essentially, it is preferred that each port upon initialization only be given a minimal buffer configuration that just sufficient to receive the first packet of print job information as it arrives at that port. When that occurs, the port then requests more memory from the pool area of RAM while the port is active." column 15, lines 7-25).

Shima '498 and Brown '817 are combinable because they are from same field of endeavor of printer systems (*"The present invention relates generally to communications equipment and is particularly directed to a printer of the type which contains multiple communications ports..."* Brown '817 at column 1, lines 12-14).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the printer systems as taught by Shima '498 by adding a 1) a receiver for receiving print data 2) a receiving buffer for storing the received print data and 3) a receiving controller for stopping receiving processing of the print data performed by the receiver when a free space in the receiving buffer has run out, and resuming the receiving processing of the print data performed by the receiver when the free space in the receiving buffer is above the predetermined value as taught by Brown '817.

The motivation for doing so would have been because it advantageous to efficiently store print job data that is being received by the printer (*"...to efficiently store print job data that is being received by the printer..."* Brown '817 at column 3, lines 65-66).

Therefore, it would have been obvious to combine Shima '498 with Brown '817 to obtain the invention as specified in claim 1.

Regarding claim 3; Shima '498 discloses wherein when the write processing is completed, the write controller empties the space of the receiving buffer where the print data written into the auxiliary storage device in this write processing has been stored (*"When conversion of the intermediate print information into a bit image is started, reception means need not stop receiving print information from the host, because conversion of the intermediate print information into a bit image is executed independently of reception of print information by the reception means. This is also applied when the trigger for conversion of the intermediate print information into a bit image is set as the storage capacity limit of the storage means. That is, if the intermediate print information is converted into a bit image and the bit image is sent to the engine, an empty area of the storage means occurs..."* column 11, lines 40-51).

Regarding claim 4; Shima '498 discloses wherein when the print data which has finished with the write processing is present in the auxiliary storage device, the developing unit reads the print data in order of writing (*"For example, if print processing is delayed and data remains in the RAM 44 on a whole, some data is stored in the auxiliary storage 45 and then read into the RAM 44 as required, whereby both of the RAM 44 and the auxiliary storage 45 are used efficiently."* column 12, lines 63-67).

Regarding claim 5; Shima '498 discloses where after reading the print data, the developing means destroys the print data in the auxiliary storage device (*"If the number of copies is reached, all information read from the storage means and printed is deleted from the storage means at step S39."* column 10, lines 1-3).

Regarding claim 6; Shima '498 discloses where the auxiliary storage device is a hard disk drive (*"The reception buffer 83 is formed in a RAM 44 and an auxiliary storage 45 such as a hard disk drive."* column 12, lines 51-52).

Regarding claim 7; Shima '498 discloses a print data processing apparatus comprising: an auxiliary storage device which can store the print data (*"...in the image information print system in the first form, the storage means consists of a RAM and auxiliary storage means..."* column 3, lines 44-46); a write controller for starting write processing to write the print data stored in the receiving buffer into the auxiliary storage device when a free space in the receiving buffer has run out, and canceling the write processing when the free space in the receiving buffer is above a predetermined value before completion of writing (*"When data is transmitted from the host 1, first the reception task 71 starts processing upon reception of the data at step T1, performs data reception processing at step T2, and stored the received data in the reception buffer 83, then transmits data at step T3. Control is transferred to another task. The reception buffer 83 is formed in a RAM 44 and an auxiliary storage 45 such as a hard disk drive. A storage management task 81 determines which of the RAM 44 and the auxiliary storage 45 the data is to be stored in. It determines which of the RAM 44 and the auxiliary storage 45 the data is to be saved in so that the data can be saved and consumed most efficiently by considering the difference between the read time and the write time caused by the difference between the RAM*

44 and the auxiliary storage 45, the print information transfer rate from the host, the print information processing (print information analysis to print execution) speed at the printer, and any other factors, as described above. For example, if print processing is delayed and data remains in the RAM 44 on a whole, some data is stored in the auxiliary storage 45 and then read into the RAM 44 as required, whereby both of the RAM 44 and the auxiliary storage 45 are used efficiently. Information concerning the storage locations of the data is written into a management table 82. The information in the management table 82 is transferred to the next task using the data. The storage management task 81 also manages the storage limit of the storage means as described above. If the storage means is about to reach the storage limit, the storage management task 81 informs, for example, the print management task 74 of the fact, as described above." column 12, lines 46-67 thru column 13, lines 1-8); and developing unit for reading the print data from the receiving buffer or the auxiliary storage device to develop the print data into image data (*"...and if conversion processing of intermediate print information into bit image data may be performed in a print information reception order in response to the paper discharge face information, converts the intermediate print information into bit image data in desired units without waiting for a cluster of intermediate print information to be stored in the storage means, or if the intermediate print information is converted into bit image data in an order reverse to the print information reception order, waits for a cluster of intermediate print information to be stored in the storage means before starting conversion of intermediate print information into bit image data."* column 4, lines 38-49); wherein when an amount of print data stored in the receiving buffer is below a first threshold value, the receiving controller sets the receiving processing into the first receiving mode, and when the amount of print data stored in the

receiving buffer has exceeded a second threshold value, the receiving controller sets the receiving processing into the second receiving mode, and when the free space in the receiving buffer has run out, the receiving controller sets the receiving processing into the suspend mode, and when the free space in the receiving buffer is above a predetermined amount, the receiving processing of the print data performed by the receiver is resumed (*"When data is transmitted from the host 1, first the reception task 71 starts processing upon reception of the data at step T1, performs data reception processing at step T2, and stores the received data in the reception buffer 83, then transmits data at step T3. Control is transferred to another task. The reception buffer 83 is formed in a RAM 44 and an auxiliary storage 45 such as a hard disk drive. A storage management task 81 determines which of the RAM 44 and the auxiliary storage 45 the data is to be stored in. It determines which of the RAM 44 and the auxiliary storage 45 the data is to be saved in so that the data can be saved and consumed most efficiently by considering the difference between the read time and the write time caused by the difference between the RAM 44 and the auxiliary storage 45, the print information transfer rate from the host, the print information processing (print information analysis to print execution) speed at the printer, and any other factors, as described above. For example, if print processing is delayed and data remains in the RAM 44 on a whole, some data is stored in the auxiliary storage 45 and then read into the RAM 44 as required, whereby both of the RAM 44 and the auxiliary storage 45 are used efficiently. Information concerning the storage locations of the data is written into a management table 82. The information in the management table 82 is transferred to the next task using the data. The storage management task 81 also manages the storage limit of the storage means as described above. If the storage means is about to reach the storage limit, the storage*

management task 81 informs, for example, the print management task 74 of the fact, as described above." column 12, lines 46-67 thru column 13, lines 1-8); and when the print data which has finished with the write processing is present in the auxiliary storage device, the developing unit reads the print data from the auxiliary storage device to develop the print data into image data ("*...and if conversion processing of intermediate print information into bit image data may be performed in a print information reception order in response to the paper discharge face information, converts the intermediate print information into bit image data in desired units without waiting for a cluster of intermediate print information to be stored in the storage means, or if the intermediate print information is converted into bit image data in an order reverse to the print information reception order, waits for a cluster of intermediate print information to be stored in the storage means before starting conversion of intermediate print information into bit image data.*" column 4, lines 38-49).

Shima '498 does not expressly disclose 1) a receiver for receiving print data 2) a receiving buffer for storing the received print data and 3) a receiving controller for switching receiving processing of the print data performed by the receiver to a first receiving mode, a second receiving mode in which the receiving processing is slower than in the first receiving mode, and a suspend mode which suspends the receiving processing.

Brown '817 discloses a receiver for receiving print data ("*...so the critical process in this situation with respect to the printer's overall throughput is the actual reception and initial buffering and processing of the incoming print data being received...*" column 19, lines 56-59); a receiving buffer for storing the received print data ("*Port B at 320 receives data and further communicates such data along a signal line 450 into "N2" receive buffers that are part of the*

input buffer 422. These receive buffers are designated by the reference numerals 451-455. Also residing in the input buffer 422 are "M2" transmit buffers 461-465, which temporarily store messages to be sent by the printer along a signal line 460 through Port B." column 17, lines 1-7); and a receiving controller for switching receiving processing of the print data performed by the receiver to a first receiving mode, a second receiving mode in which the receiving processing is slower than in the first receiving mode, and a suspend mode which suspends the receiving processing (*"A second embodiment of an improved communications buffer system relating to the present invention is also provided which dynamically allocates the size and number of buffers for each of several different communications ports that are installed on a printer, while efficiently using the allocated memory so as to provide optimal throughput capability with respect to the allocated amount of memory. This second embodiment communications buffer system uses many of the principles described hereinabove with respect to the communications buffer system described in FIGS. 1-8. The second communications buffer system is primarily designed to efficiently assign memory space for buffers used by the several communications ports from a predetermined amount of memory space (as a "pool" of memory) that has been allocated for external communications functions by the printer 10. It is preferred that the input buffer 22 be allocated a certain percentage of the printer's overall RAM, and then the control system described herein below will determine how much of that allocated RAM shall be provided for the buffers used by each of the individual ports. Upon initialization of the printer, the pool of RAM that is allocated for the communications ports will be a relatively large quantity, however, each individual port will only be allocated a fairly small portion of that pool area of RAM. Essentially, it is preferred that each port upon initialization only be given a minimal buffer*

configuration that just sufficient to receive the first packet of print job information as it arrives at that port. When that occurs, the port then requests more memory from the pool area of RAM while the port is active." column 14 , lines 63-67 thru column 15, lines 1-25).

Shima '498 and Brown '817 are combinable because they are from same field of endeavor of printer systems (*"The present invention relates generally to communications equipment and is particularly directed to a printer of the type which contains multiple communications ports..."* Brown '817 at column 1, lines 12-14).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the printer systems as taught by Shima '498 by adding a 1) a receiver for receiving print data 2) a receiving buffer for storing the received print data and 3) a receiving controller for switching receiving processing of the print data performed by the receiver to a first receiving mode, a second receiving mode in which the receiving processing is slower than in the first receiving mode, and a suspend mode which suspends the receiving processing as taught by Brown '817.

The motivation for doing so would have been because it advantageous to efficiently store print job data that is being received by the printer (*"...to efficiently store print job data that is being received by the printer..."* Brown '817 at column 3, lines 65-66).

Therefore, it would have been obvious to combine Shima '498 with Brown '817 to obtain the invention as specified in claim 7.

Regarding claim 9; Shima '498 discloses wherein when the write processing is completed, the write controller empties the space of the receiving buffer where the print data written into the auxiliary storage device in this write processing has been stored (*"When*

conversion of the intermediate print information into a bit image is started, reception means need not stop receiving print information from the host, because conversion of the intermediate print information into a bit image is executed independently of reception of print information by the reception means. This is also applied when the trigger for conversion of the intermediate print information into a bit image is set as the storage capacity limit of the storage means. That is, if the intermediate print information is converted into a bit image and the bit image is sent to the engine, an empty area of the storage means occurs..." column 11, lines 40-51).

Regarding claim 10; Shima '498 discloses wherein when the print data which has finished with the write processing is present in the auxiliary storage device, the developing unit reads the print data in order of writing (*"For example, if print processing is delayed and data remains in the RAM 44 on a whole, some data is stored in the auxiliary storage 45 and then read into the RAM 44 as required, whereby both of the RAM 44 and the auxiliary storage 45 are used efficiently."* column 12, lines 63-67).

Regarding claim 11; Shima '498 discloses wherein after reading the print data, the developing unit destroys the print data in the auxiliary storage device (*"If the number of copies is reached, all information read from the storage means and printed is deleted from the storage means at step S39."* column 10, lines 1-3).

Regarding claim 12; Shima '498 discloses wherein the auxiliary storage device is a hard disk drive (*"The reception buffer 83 is formed in a RAM 44 and an auxiliary storage 45 such as a hard disk drive."* column 12, lines 51-52).

Regarding claim 13; Shima '498 discloses wherein when the receiving processing by the receiver is resumed, it is resumed in the first receiving mode or the second receiving mode, depending on the amount of print data stored in the receiving buffer (*"When data is transmitted from the host 1, first the reception task 71 starts processing upon reception of the data at step T1, performs data reception processing at step T2, and stores the received data in the reception buffer 83, then transmits data at step T3. Control is transferred to another task. The reception buffer 83 is formed in a RAM 44 and an auxiliary storage 45 such as a hard disk drive. A storage management task 81 determines which of the RAM 44 and the auxiliary storage 45 the data is to be stored in. It determines which of the RAM 44 and the auxiliary storage 45 the data is to be saved in so that the data can be saved and consumed most efficiently by considering the difference between the read time and the write time caused by the difference between the RAM 44 and the auxiliary storage 45, the print information transfer rate from the host, the print information processing (print information analysis to print execution) speed at the printer, and any other factors, as described above. For example, if print processing is delayed and data remains in the RAM 44 on a whole, some data is stored in the auxiliary storage 45 and then read into the RAM 44 as required, whereby both of the RAM 44 and the auxiliary storage 45 are used efficiently. Information concerning the storage locations of the data is written into a management table 82. The information in the management table 82 is transferred to the next task using the data. The storage management task 81 also manages the storage limit of the storage means as described above. If the storage means is about to reach the storage limit, the storage management task 81 informs, for example, the print management task 74 of the fact, as described above."* column 12, lines 46-67 thru column 13, lines 1-8).

Regarding claim 14; Shima '498 discloses a print data processing method comprising the steps of: reading the print data from the receiving buffer to develop the print data into image data ("*...and if conversion processing of intermediate print information into bit image data may be performed in a print information reception order in response to the paper discharge face information, converts the intermediate print information into bit image data in desired units without waiting for a cluster of intermediate print information to be stored in the storage means, or if the intermediate print information is converted into bit image data in an order reverse to the print information reception order, waits for a cluster of intermediate print information to be stored in the storage means before starting conversion of intermediate print information into bit image data.*" column 4, lines 38-49); stopping receiving processing of the print data performed by receiving device when a free space in the receiving buffer has run out, and starting writing of the print data stored in the receiving buffer into an auxiliary storage device ("*When data is transmitted from the host 1, first the reception task 71 starts processing upon reception of the data at step T1, performs data reception processing at step T2, and stores the received data in the reception buffer 83, then transmits data at step T3. Control is transferred to another task. The reception buffer 83 is formed in a RAM 44 and an auxiliary storage 45 such as a hard disk drive. A storage management task 81 determines which of the RAM 44 and the auxiliary storage 45 the data is to be stored in. It determines which of the RAM 44 and the auxiliary storage 45 the data is to be saved in so that the data can be saved and consumed most efficiently by considering the difference between the read time and the write time caused by the difference between the RAM 44 and the auxiliary storage 45, the print information transfer rate from the host, the print information processing (print information analysis to print execution) speed at the printer, and*

any other factors, as described above. For example, if print processing is delayed and data remains in the RAM 44 on a whole, some data is stored in the auxiliary storage 45 and then read into the RAM 44 as required, whereby both of the RAM 44 and the auxiliary storage 45 are used efficiently. Information concerning the storage locations of the data is written into a management table 82. The information in the management table 82 is transferred to the next task using the data. The storage management task 81 also manages the storage limit of the storage means as described above. If the storage means is about to reach the storage limit, the storage management task 81 informs, for example, the print management task 74 of the fact, as described above." column 12, lines 46-67 thru column 13, lines 1-8); and when the free space of the receiving buffer reaches a predetermined amount or more before completion of the write processing into the auxiliary storage device, canceling the writing, and resuming the receiving processing of the print data performed by the receiving device (*"When conversion of the intermediate print information into a bit image is started, reception means need not stop receiving print information from the host, because conversion of the intermediate print information into a bit image is executed independently of reception of print information by the reception means. This is also applied when the trigger for conversion of the intermediate print information into a bit image is set as the storage capacity limit of the storage means. That is, if the intermediate print information is converted into a bit image and the bit image is sent to the engine, an empty area of the storage means occurs..."* column 11, lines 40-51).

Shima '498 does not expressly disclose receiving print data and storing the print data in a receiving buffer.

Brown '817 discloses receiving print data ("*...so the critical process in this situation with respect to the printer's overall throughput is the actual reception and initial buffering and processing of the incoming print data being received...*" column 19, lines 56-59); and storing the print data in a receiving buffer ("*Port B at 320 receives data and further communicates such data along a signal line 450 into "N2" receive buffers that are part of the input buffer 422. These receive buffers are designated by the reference numerals 451-455. Also residing in the input buffer 422 are "M2" transmit buffers 461-465, which temporarily store messages to be sent by the printer along a signal line 460 through Port B.*" column 17, lines 1-7).

Shima '498 and Brown '817 are combinable because they are from same field of endeavor of printer systems ("*The present invention relates generally to communications equipment and is particularly directed to a printer of the type which contains multiple communications ports...*" Brown '817 at column 1, lines 12-14).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the printer systems as taught by Shima '498 by adding receiving print data and storing the print data in a receiving buffer as taught by Brown '817.

The motivation for doing so would have been because it advantageous to efficiently store print job data that is being received by the printer ("*...to efficiently store print job data that is being received by the printer,*" Brown '817 at column 3, lines 65-66).

Therefore, it would have been obvious to combine Shima '498 with Brown '817 to obtain the invention as specified in claim 14.

Regarding claim 15; Shima '498 discloses having a step of, when the print data which has finished with the write processing is present in the auxiliary storage device, reading the print data from the auxiliary storage device to develop the print data into image data (*"For example, if print processing is delayed and data remains in the RAM 44 on a whole, some data is stored in the auxiliary storage 45 and then read into the RAM 44 as required, whereby both of the RAM 44 and the auxiliary storage 45 are used efficiently."* column 12, lines 63-67)

Regarding claim 17; Shima '498 discloses wherein when the write processing is completed, the space of the receiving buffer where the print data written into the auxiliary storage device in this write processing has been stored is emptied (*"When conversion of the intermediate print information into a bit image is started, reception means need not stop receiving print information from the host, because conversion of the intermediate print information into a bit image is executed independently of reception of print information by the reception means. This is also applied when the trigger for conversion of the intermediate print information into a bit image is set as the storage capacity limit of the storage means. That is, if the intermediate print information is converted into a bit image and the bit image is sent to the engine, an empty area of the storage means occurs..."* column 11, lines 40-51).

Regarding claim 18; Shima '498 discloses wherein when the print data which has finished with the write processing is present in the auxiliary storage device, the print data is read in order of writing (*"For example, if print processing is delayed and data remains in the RAM 44 on a whole, some data is stored in the auxiliary storage 45 and then read into the RAM 44 as required, whereby both of the RAM 44 and the auxiliary storage 45 are used efficiently."* column 12, lines 63-67).

Regarding claim 19; Shima '498 discloses wherein after the print data is read, the print data in the auxiliary storage device is destroyed (*"If the number of copies is reached, all information read from the storage means and printed is deleted from the storage means at step S39."* column 10, lines 1-3).

Regarding claim 20; Shima '498 discloses a print data processing apparatus comprising: an auxiliary storage device which can store the data (*"...in the image information print system in the first form, the storage means consists of a RAM and auxiliary storage means..."* column 3, lines 44-46); a write controller for starting write processing to write the data stored in the receiving buffer into the auxiliary storage device when the free space in the receiving buffer has run out, and canceling the write processing when the free space in the receiving buffer is above a predetermined value before completion of writing (*"When data is transmitted from the host 1, first the reception task 71 starts processing upon reception of the data at step T1, performs data reception processing at step T2, and stored the received data in the reception buffer 83, then transmits data at step T3. Control is transferred to another task. The reception buffer 83 is formed in a RAM 44 and an auxiliary storage 45 such as a hard disk drive. A storage management task 81 determines which of the RAM 44 and the auxiliary storage 45 the data is to be stored in. It determines which of the RAM 44 and the auxiliary storage 45 the data is to be saved in so that the data can be saved and consumed most efficiently by considering the difference between the read time and the write time caused by the difference between the RAM 44 and the auxiliary storage 45, the print information transfer rate from the host, the print information processing (print information analysis to print execution) speed at the printer, and any other factors, as described above. For example, if print processing is delayed and data*

remains in the RAM 44 on a whole, some data is stored in the auxiliary storage 45 and then read into the RAM 44 as required, whereby both of the RAM 44 and the auxiliary storage 45 are used efficiently. Information concerning the storage locations of the data is written into a management table 82. The information in the management table 82 is transferred to the next task using the data. The storage management task 81 also manages the storage limit of the storage means as described above. If the storage means is about to reach the storage limit, the storage management task 81 informs, for example, the print management task 74 of the fact, as described above." column 12, lines 46-67 thru column 13, lines 1-8); and processing means for reading the data from the receiving buffer or the auxiliary storage device to process the print data (*"For example, if print processing is delayed and data remains in the RAM 44 on a whole, some data is stored in the auxiliary storage 45 and then read into the RAM 44 as required, whereby both of the RAM 44 and the auxiliary storage 45 are used efficiently."* column 12, lines 63-67); and wherein when the data which has finished with the write processing is present in the auxiliary storage device, the processing means reads the data from the auxiliary storage device to process the data (*"When data is transmitted from the host 1, first the reception task 71 starts processing upon reception of the data at step T1, performs data reception processing at step T2, and stores the received data in the reception buffer 83, then transmits data at step T3. Control is transferred to another task. The reception buffer 83 is formed in a RAM 44 and an auxiliary storage 45 such as a hard disk drive. A storage management task 81 determines which of the RAM 44 and the auxiliary storage 45 the data is to be stored in. It determines which of the RAM 44 and the auxiliary storage 45 the data is to be saved in so that the data can be saved and consumed most efficiently by considering the difference between the read time and the write time caused by the*

difference between the RAM 44 and the auxiliary storage 45, the print information transfer rate from the host, the print information processing (print information analysis to print execution) speed at the printer, and any other factors, as described above. For example, if print processing is delayed and data remains in the RAM 44 on a whole, some data is stored in the auxiliary storage 45 and then read into the RAM 44 as required, whereby both of the RAM 44 and the auxiliary storage 45 are used efficiently." column 12, lines 46-67).

Shima '498 does not expressly disclose 1) a receiver for receiving data 2) a receiving buffer for storing the received data 3) a receiving controller for stopping receiving processing of the data performed by the receiver when a free space in the receiving buffer has run out, and resuming the receiving processing of the data performed by the receiver when the free space in the receiving buffer is above a predetermined amount.

Brown '817 discloses a receiver for receiving data (*"...so the critical process in this situation with respect to the printer's overall throughput is the actual reception and initial buffering and processing of the incoming print data being received..."* column 19, lines 56-59); and a receiving buffer for storing the received data (*"Port B at 320 receives data and further communicates such data along a signal line 450 into "N2" receive buffers that are part of the input buffer 422. These receive buffers are designated by the reference numerals 451-455. Also residing in the input buffer 422 are "M2" transmit buffers 461-465, which temporarily store messages to be sent by the printer along a signal line 460 through Port B."* column 17, lines 1-7); a receiving controller for stopping receiving processing of the data performed by the receiver when a free space in the receiving buffer has run out, and resuming the receiving processing of the data performed by the receiver when the free space in the receiving buffer is above a

predetermined amount (*"The second communications buffer system is primarily designed to efficiently assign memory space for buffers used by the several communications ports from a predetermined amount of memory space (as a "pool" of memory) that has been allocated for external communications functions by the printer 10. It is preferred that the input buffer 22 be allocated a certain percentage of the printer's overall RAM, and then the control system described herein below will determine how much of that allocated RAM shall be provided for the buffers used by each of the individual ports. Upon initialization of the printer, the pool of RAM that is allocated for the communications ports will be a relatively large quantity, however, each individual port will only be allocated a fairly small portion of that pool area of RAM. Essentially, it is preferred that each port upon initialization only be given a minimal buffer configuration that just sufficient to receive the first packet of print job information as it arrives at that port. When that occurs, the port then requests more memory from the pool area of RAM while the port is active."* column 15, lines 7-25).

Shima '498 and Brown '817 are combinable because they are from same field of endeavor of printer systems (*"The present invention relates generally to communications equipment and is particularly directed to a printer of the type which contains multiple communications ports..."* Brown '817 at column 1, lines 12-14).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the printer systems as taught by Shima '498 by adding 1) a receiver for receiving data 2) a receiving buffer for storing the received data 3) a receiving controller for stopping receiving processing of the data performed by the receiver when a free space in the

receiving buffer has run out, and resuming the receiving processing of the data performed by the receiver when the free space in the receiving buffer is above a predetermined amount as taught by Brown '817.

The motivation for doing so would have been because it advantageous to efficiently store print job data that is being received by the printer (*"...to efficiently store print job data that is being received by the printer..."* Brown '817 at column 3, lines 65-66).

Therefore, it would have been obvious to combine Shima '498 with Brown '817 to obtain the invention as specified in claim 20.

3. **Claims 2, 8 and 16** are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Shima '498 and Brown '817 as applied to claim 1 above, and further in view of Emoto (US 6,788,430 hereinafter, Emoto '430).

Regarding claim 2; the combination of Shima '498 and Brown '817 does not expressly disclose wherein when the write processing is cancelled, the write controller destroys the print data in the auxiliary storage device.

Emoto '430 discloses wherein when the write processing is cancelled, the write controller destroys the print data in the auxiliary storage device (*"...the print request managing task generates the print data and the storage data for each page, and the print execution task executes printing and transmits the print end report for each page, and sequentially delete data from the storage data stored in the auxiliary storage device by page to page when printing of such page of the final copy is finished, the occupied region in the auxiliary storage device can be released earlier."* column 5, lines 41-46).

Shima '498 and Brown '817 are combinable with Emoto '430 because they are from same field of endeavor of printer systems (*"This invention relates to a printer, printer control method..."* Emoto '430 at column 1, line 9).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the printer systems as taught by Shima '498 and Brown '817 by adding wherein when the write processing is cancelled, the write controller destroys the print data in the auxiliary storage device as taught by Emoto '430.

The motivation for doing so would have been because it advantageous to provide a printer which requires a time as short as possible until completing a printing job either upon one-copy printing or upon collate printing (*"...to provide a printer which requires a time as short as possible until completing a printing job either upon one-copy printing or upon collate printing."* Emoto '430 at column 2, lines 17-20).

Therefore, it would have been obvious to combine Shima '498 with Brown '817 with Emoto '430 to obtain the invention as specified in claim 1.

Regarding claim 8; Emoto '430 discloses wherein when the write processing is cancelled, the write controller destroys the print data in the auxiliary storage device (*"...the print request managing task generates the print data and the storage data for each page, and the print execution task executes printing and transmits the print end report for each page, and sequentially delete data from the storage data stored in the auxiliary storage device by page to page when printing of such page of the final copy is finished, the occupied region in the auxiliary storage device can be released earlier."* column 5, lines 41-46).

Regarding claim 16; Emoto '430 discloses wherein when the write processing is cancelled, the print data in the auxiliary storage device is destroyed ("*...the print request managing task generates the print data and the storage data for each page, and the print execution task executes printing and transmits the print end report for each page, and sequentially delete data from the storage data stored in the auxiliary storage device by page to page when printing of such page of the final copy is finished, the occupied region in the auxiliary storage device can be released earlier.*" column 5, lines 41-46).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marcus T. Riley whose telephone number is 571-270-1581. The examiner can normally be reached on Monday - Friday, 7:30-5:00, est.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Twyler Lamb can be reached on 571-272-7406. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Marcus T. Riley
Assistant Examiner
Art Unit 2625

TWYLER LAMB
SUPERVISORY PATENT EXAMINER